

Claims

1. A method for enabling wireless presence-based services comprising:
 - 5 monitoring, by a wireless communications network, messaging and messaging responses of a mobile station (MS), wherein the messaging and the messaging responses do not explicitly specify a presence state of the MS or a presence state change by the MS;
 - 10 inferring, by the wireless communications network, a change in the presence state of the MS based upon the monitoring;
 - 15 communicating, by the wireless communications network, the state change to a presence server.
2. The method of claim 1, wherein the messaging responses comprise responses from the group consisting of a page response, a short data burst (SDB) acknowledgment, a status response message, a short message service (SMS) acknowledgment, and a layer 2 acknowledgment.
3. The method of claim 1, wherein communicating the state change comprises communicating the state change to the presence server via 20 internet messaging.
4. The method of claim 1, wherein communicating the state change comprises communicating the state change to the presence server via Session Initiation Protocol (SIP) messaging.
- 25 5. The method of claim 1, wherein inferring comprises:
 - inferring the MS presence state has changed when the presence state of the MS indicates that the MS is present and messaging is detected that indicates MS activity from the group consisting of powering down, 30 deregistering, entering an unavailable mode, handing off outside the wireless communication network, and involved in other communication.

6. The method of claim 1, wherein inferring comprises:
inferring the MS presence state has changed when the presence state
of the MS indicates that the MS is non-present and messaging is detected
that indicates MS activity from the group consisting of powering up,
5 registering, exiting an unavailable mode, handing off into the wireless
communication network, and performing other communication.
7. The method of claim 1, further comprising:
10 signaling, by the wireless communications network, the MS with
messaging to which the MS is required to respond.
8. The method of claim 7, wherein messaging to which the MS is required
to respond comprises messaging from the group consisting of a page, a short
data burst (SDB) message, a status-request message, and a short message
15 service (SMS) message.
9. The method of claim 7,
20 wherein monitoring comprises maintaining last-known-location
information for the MS based on the messaging and the messaging
responses,
wherein signaling the MS comprises signaling the MS in a group of at
least one cell based on the last-known-location information for the MS.
10. The method of claim 9, wherein the last-known-location information
25 comprises location information of a type from the group consisting of a cell ID,
a base station ID, and a list of cell IDs.
11. The method of claim 7, wherein signaling the MS is triggered by an
event from the group consisting of an expiration of a periodic time interval, an
30 expiration of a random time interval, and receiving a request from the
presence server.

12. The method of claim 7, wherein monitoring comprises receiving, by the wireless communications network, a messaging response in response to the signaling and wherein the method further comprises:

5 inferring, by the wireless communications network, no change in a presence state of the MS based upon the monitoring;

confirming, by the wireless communications network, the presence state to a presence server.

13. The method of claim 7,

10 wherein monitoring comprises detecting that a period of time has passed after signaling the MS in which no response to the signaling has been received,

wherein the no response within the period of time is a messaging response,

15 wherein inferring comprises inferring a change in the presence state of the MS based upon the messaging response when the presence state of the MS indicates that the MS is present.

14. The method of claim 7,

20 wherein monitoring comprises detecting that a period of time has passed after repeatedly signaling the MS in which no response to the signaling has been received,

wherein the no response within the period of time is a messaging response,

25 wherein inferring comprises inferring a change in the presence state of the MS based upon the messaging response when the presence state of the MS indicates that the MS is present.

15. The method of claim 7,

30 wherein the wireless communications network comprises a mobile switching center (MSC) and a base station (BS),

wherein signaling the MS comprises signaling the MS in a paging area indicated by the MSC.

16. The method of claim 15,
wherein monitoring comprises updating last-known-location information
for the MS based on a messaging response to the signaling.

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17. The method of claim 7,
wherein the wireless communications network comprises a control
function and a base station (BS),
wherein the control function sends a signaling request message to the
10 BS,
wherein signaling the MS comprises signaling by the BS in response to
the signaling request message.

18. The method of claim 17, wherein the control function comprises a
15 packet control function (PCF).

19. The method of claim 17, wherein the wireless communications network
comprises a mobile switching center (MSC) and wherein the MSC comprises
the control function.

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20. The method of claim 17, wherein the wireless communications network
comprises a mobile switching center (MSC) and a packet control function
(PCF), wherein the control function is distributed between the MSC and the
PCF.

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21. The method of claim 17, wherein the signaling request message
comprises an A9-Short Data Delivery message.

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22. The method of claim 21, wherein the signaling request message
indicates a signaling location within which to signal the MS.

23. The method of claim 17, wherein the BS sends an indication to the
control function of whether a response from the MS was received.

24. The method of claim 23, wherein the indication to the control function comprises an A9-Short Data Ack message.

5 25. The method of claim 17, wherein the BS receives a messaging response from the MS in response to the signaling.

26. The method of claim 25, wherein the messaging response comprises a layer 2 acknowledgment from the MS.

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27. The method of claim 17,
wherein inferring comprises inferring, by the control function, a change in the presence state of the MS based upon the monitoring;
wherein communicating comprises communicating, by the control
15 function, the state change to a presence server.

28. A wireless communications network comprising:
 wireless transceiver equipment adapted to receive messaging and
 messaging responses of a mobile station (MS);
 a wireless presence proxy, communicatively coupled to the wireless
5 transceiver equipment,
 adapted to monitor the messaging and the messaging
 responses of the MS, wherein the messaging and the messaging responses
 do not explicitly specify a presence state of the MS or a presence state
 change by the MS,
10 adapted to infer a change in the presence state of the MS
 based upon the monitoring,
 adapted to communicate the state change to a presence server.

15. 29. The wireless communications network of claim 28, wherein the
 presence server comprises a presence server from the group consisting of an
 instant messaging (IM) server and a push-to-talk (PTT) server.

20. 30. The wireless communications network of claim 28, wherein the
 messaging responses comprise responses from the group consisting of a
 page response, a short data burst (SDB) acknowledgment, a status response
 message, a short message service (SMS) acknowledgment, and a layer 2
 acknowledgment.

25. 31. The wireless communications network of claim 28, wherein the
 wireless presence proxy is further adapted to signal via the wireless
 transceiver equipment the MS with messaging to which the MS is required to
 respond.

32. The wireless communications network of claim 31,
wherein monitoring comprises detecting that a period of time has
passed after repeatedly signaling the MS in which no response to the
signaling has been received,

5 wherein the no response within the period of time is a messaging
response,

wherein inferring comprises inferring a change in the presence state of
the MS based upon the messaging response when the presence state of the
MS indicates that the MS is present.

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33. The wireless communications network of claim 31,
wherein monitoring comprises maintaining last-known-location
information for the MS based on the messaging and the messaging
responses,

15 wherein signaling the MS comprises signaling the MS in a group of at
least one cell based on the last-known-location information for the MS.